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ABSTRACT

Trends in academic performance from 1961 to 1979 for entering freshmen at Georgia State University were examined. Verbal and mathematics scores of the Scholastic Aptitude Test (SAT), high school average (HSA), and freshman grade point average (GPA) were analyzed. It was found that SAT verbal and mathematics scores remained generally stable; over time the mean SAT averages dropped one point a year. HSAs showed a very slight increase over time, and the mean freshman GPA increased slightly. SAT scores furnished only a slight indication of the progress of freshman students as measured by the amount of hours they took from fall to spring quarters. The association of student progress with HSA was greater than with SAT scores, but it was still at a low level. The relationship of SAT scores and HSAs to freshman mean GPAs suggests that HSAs more strongly affect male GPAs. SAT verbal scores appear to have a stronger impact on grades for females. Additionally, the SAT verbal score was more critical for freshman performance at Georgia State University than at other large institutions in the University System of Georgia. Among the study implications are the following: the atypically high association between SAT verbal scores and performance, independent of HSA, suggests special consideration of students with high SAT verbal scores and low HSAs; the slow progress of many freshmen with lower grades in their first 25 hours of coursework may be countered in some cases by tutoring, counseling, and special advisement; and there is a need for multiple admissions criteria for transfer students. Appended are the following: enrollment trend data, the distribution of academic scores as illustrated by the graph method of box and whisker plots, and prediction equations for selected university system institutions. (SW)

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TRENDS IN ACADEMIC PERFORMANCE AND APTITUDE OF BEGINNING FRESHMEN

Institutional Research Report No. 81-11

by

James E. Prather

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Office of Institutional Planning
Georgia State University
February, 1981

Abstract

This report has addressed academic performance trends for entering freshmen. The study was based upon the population of beginning freshmen as defined by the publication of the Board of Regents' normative data for freshmen from 1961 to 1979. The measures used in this report include the verbal and mathematics scores of the Scholastic Aptitude Test, high school average, and freshman grade point average.

The key findings of this research were:

- For Georgia State University, SAT verbal and mathematics scores remained generally stable; over time the mean SAT average dropped one point a year. High School averages showed a very slight increase over time of .015 per year in mean HSA. The mean freshman GPA increased slightly, from 2.27 in 1970 to 2.34 in 1979, averaging an increase of .009.

- SAT scores furnished only a slight indication of the progress of freshman students as measured by the amount of hours they took from fall to spring quarters of their freshman year. The association of student progress with high school average was greater than with SAT scores, but it was still at a low level.

- The average difference in mean GPA's between freshmen who attempted less than 25 hours and those who attempted 25 or more hours was .14, suggesting that slow progress relates to poor course grades.

- The relationship of SAT scores and high school averages to freshman mean GPA's suggests high school averages impact more strongly upon GPA's for males than for females. SAT verbal scores appear to have a stronger impact on grades for females than for males.

- For a given set of SAT scores and high school averages, freshman mean GPA's have tended to drop since the mid-70's.

- Relative to selected System institutions, freshmen at Georgia State University achieved lower GPA's, controlling for their SAT scores and high school averages.

- The SAT verbal score was more critical for freshman performance at Georgia State University than at other large institutions in the University System of Georgia.

These findings may be tentatively addressed to certain policy implications, including:

- GPA's for freshmen across System institutions vary widely for a given ability level, suggesting a need for multiple admissions criteria for transfer students from different institutions applying to Georgia State University.

- To develop prediction equations at Georgia State University for lower division transfer students from major feeder colleges is not out of the realm of possibility, but such a project would require additional financial resources to expand and enhance the present student data base and provide needed technical computer support.

- The atypically high association between SAT verbal scores and performance, independent of high school average, suggests special consideration of students with high SAT verbal scores and low high school averages.

- The slower progress of many freshmen with lower grades in their first 25 hours of coursework may be countered, in some cases, by tutoring, counseling and special advisement; the cost/benefit ratio for such special programs may be unfavorable.

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Trends in Academic Performance and Aptitude of Beginning Freshmen

Introduction and Purpose

The widespread concern about student retention has prompted this report. The magnitude of obtaining or retrieving vital historical demographic and academic student data, combined with the "drop-in" and "drop-out" fluid nature of the student body[1] point to difficulties in a study of retention at Georgia State University.

The purpose of this report is to describe trends in academic performance and aptitude indicators for beginning freshmen. While this beginning freshman group represents a small portion (less than 5%) of total Georgia State University students, findings from this study may suggest some hypotheses for academic performance and aptitude indicators of the largest group of students--those undergraduates who enter in a transfer status.

Prediction of academic performance in coursework has been attempted for many years. In the 1950's, policies of the Board of Regents established a standard set of measures of student past performance and indicators of future performance that would be required of each applicant to an institution of the University System of Georgia. In 1961 Georgia State University established a new set of entrance requirements. A body of Regents' data accumulated since that time is available for an analysis of trends in academic indicators and performance of beginning freshmen.

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[1] In Fiscal Year 1980, the number of individual students attending Georgia State University totaled 32,887; the average quarterly enrollment was 18,349.

Review of the Literature

The procedure for developing normative data in the University System of Georgia has been described by Hills (1964). Fincher (1974) gave an evaluation of this procedure in the University System over a thirteen year period. The procedural framework is quite simple--it involves the use of scores on both verbal and mathematics sections of the Scholastic Aptitude Test (SAT) in conjunction with the student's high school grade point average (HSA). These three measures have been used by many institutions throughout the nation to predict college success as measured by freshman grade point average (GPA). Slack and Porter (1980) in their review of the use of the SAT verbal and mathematics tests found that high school averages are better predictors of college performance. They noted that the literature through the years has shown that the student's high school record is generally a better predictor of college grades than are the SAT scores alone. Jackson (1980) indicated that the improvement in prediction from the addition of the SAT scores over use of the high school average alone is 25%.

The high school record of a student reflects a wide range of experience in classes and on examinations and with a variety of instructors that is closely relevant to college curriculum. Similarly the college experience has some of the same requirements. This is demonstrated by the strong association of high school grades with college grades. The contribution of SAT scores as measures of potential college accomplishment is that the scores provide a systematic basis for comparing applicants from widely varying high schools and personal circumstances. Their use in combination as an indicator of grade performance is stressed, rather than the use of either SAT scores or high school averages alone.

It has been noted that the student is the most important input into the teaching and learning process because student ability and aptitude are the primary determinants of educational outcome (Fincher, 1979).

Plan of the Study

The "norms" booklets on entering freshmen published annually by the Board of Regents provide the data source for this study. These booklets display SAT scores, high school averages, and freshman GPA at the end of three quarters. Some minor operational changes have been reflected in these booklets.[2] The focus of this study will be the period from 1970-79, with selected data from 1961-1967 given to complete the 19-year span. The prediction equations that Hills (1964) set forth using the SAT scores and the high school average are also presented. Both distributions of high school averages and of freshman GPA's are reported in the "standard" 4-point score, where A = 4 and D = 1. The distributions of SAT's are on the standard normalized 200-800 score (Mean = 500; S.D. = 100). For those years where comparable data are available, the distribution of SAT scores and high school and freshman averages are reported for the total along with males and females separately. The rationale for reporting males and females is based on the research that has shown males as a group to have higher mathematics SAT scores, while females as a group tend to have higher SAT verbal scores. Additionally, females tend to have higher high school and freshman averages.

For the purpose of having a quasi-control group, indicators for the beginning freshman class at the University of Georgia are also reported.

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[2] Prior to the fall 1970 class of beginning freshmen, GPA's were based upon a minimum of 40 hours. Beginning with the 1970 group, the GPA was based upon a minimum of attempting 25 or more credit hours from fall quarter through the following spring quarter.

University of Georgia data are used to assess whether changes in beginning freshman populations at Georgia State University are independent of general population changes in entering freshmen.[3]

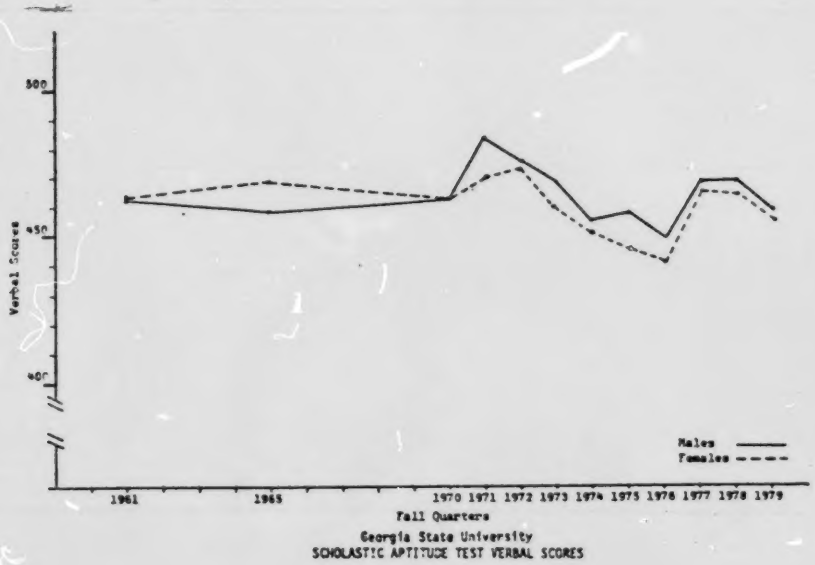
First, the study examines normative data for males at Georgia State University, followed by data for females, and then total data, with data for the University of Georgia students being used as the control. Beginning freshman progress and achievement will be assessed, and finally, observations will be made about formulas in the University System of Georgia. For a description of the size and growth of the beginning freshman group at Georgia State University relative to the University as a whole, see Appendix A.

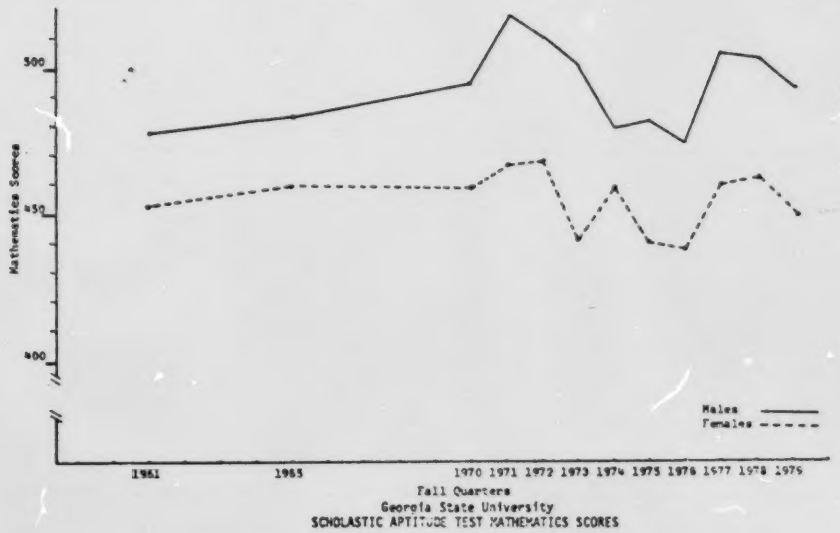
Findings

Distribution of Male Scores

The SAT verbal mean scores for males who entered as beginning freshmen during the fall quarter of the period 1961-1979 are graphed in Figure 1. The basic consistency of distributions during these years is notable (see Appendix B). Both SAT verbal and mathematics have been estimated to have dropped an average of 1 point a year from 1970 to 1979 (see Appendix C). A review of SAT mathematics mean scores shows a greater range of variability when compared with the verbal scores. Also, the swings in the distribution of mathematics scores at Georgia State University for males are interesting in light of national trends. In 1961, entering freshman males had a mean SAT mathematics score of 479 compared to the 1979 group with a mean score of 494 (Table B-2). However, in the intervening years, the mean score had been as high as 517 in 1971 and as low as 475 in 1976.

[3] The University of Georgia was selected because it is also a Category I institution in the University System.





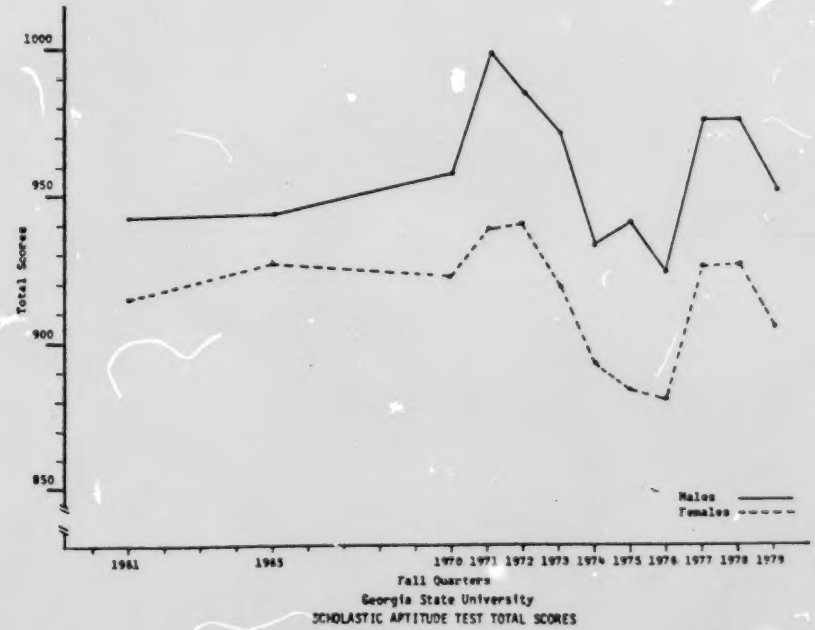


Figure 1
SAT SCORES

The high school averages reported in this study are based upon only those high school courses that are general requirements for college admission. Table B-3 shows that in the fall of 1961, entering freshman males had a mean high school average of 2.66, identical to the 1979 group. The range was from a low of 2.51 in 1969 to a high of 2.80 in 1977. From 1970 to 1979 the estimated increase has been .01 a year (Table C-2). Ability level as measured by the SAT remained generally steady throughout this period, and the high school average has hardly deviated more than 10% in this period. These trends might be unexpected in light of the public debate about grade inflation.

Those entering freshmen who attempted 25 hours from fall through spring quarters accounted for about 60% of total fall entering freshmen. This low percentage, compared to that of residential institutions, is indicative of the large number of part-time entering freshmen at Georgia State University.

Freshman GPA's were generally stable for men, from 2.19 in 1970 to 2.28 in 1979. The mean GPA increase per year from 1970 to 1979 was estimated to be .009 with a standard error of .013 (Table C-2).

Distribution of Female Scores

Comparable SAT mean scores are shown for female entering freshmen in Figure 1. The mean SAT verbal was quite stable over this period with a peak mean of 473 in 1972, and the lowest mean of 441 in 1976. The most substantial change in the distribution is that from 1977 to 1979. The lower range of scores became more restricted; 99% of the beginning freshman classes of 1977 and 1978 had SAT verbal scores of above 340; for the 1979 class, 99% were above 360.

A similar pattern of SAT mathematics scores was found (see Table B-6). In 1961, the SAT mathematics mean score was 452 compared to 451 in 1979. The peak mean of 473 was in 1973, while the lowest mean of 439 was recorded in 1975 and 1976. As with the verbal score, during the period 1977-1979 there was a marked decrease in scores below 340. SAT mathematics scores also tended to drop at the estimated rate of one point a year from 1970-1979.

The high school averages for beginning freshman females are displayed in Table B-7. These distributions show that over the 19-year period the range in mean high school averages was 2.86 to 3.10. The female HSA mean was estimated to have increased .011 a year for 1970-1979. The steady increase observed from 1976 to 1978, however, did not continue in 1979. Table B-8 gives the distribution of freshman female GPA's from 1970-1979. The mean GPA increased from 2.34 in 1970 to 2.56 in 1975. By 1979 the mean GPA was 2.39. (The estimated increase from 1970 to 1979 was .009 a year.) Since the distribution of SAT scores and high school averages for female students had hardly changed over the 19-year period, only slight changes in mean GPA's should be expected. No evidence is found to indicate grade inflation for this student population.

Distribution of Total Scores

This section describes trends for entering freshmen as a group, combining male and female scores. It should be noted, however, that during this period the proportion of males to females dropped from a 50-50 split during the 1960's to a split of 45-55 by the late 1970's. Given that males and females have different average SAT scores, high school averages and GPA's, some of the changes in the total scores are obviously due to the change in the demographic proportions.

For the 1961 group, the mean SAT verbal score was 464. The highest mean was 476 in 1971, with the lowest mean of 445 in 1976. A mean of 456 was recorded for the 1979 group. The distributions of scores were very similar except for the years between 1974 and 1976 (see Table B-9). The average drop was estimated at one point a year from 1970 to 1979.

For research control purposes, the distribution of indicators for beginning freshmen at the University of Georgia are provided. Table B-10 shows that mean SAT's peaked at the University of Georgia in the early 1970's, similar in magnitude to the peak at Georgia State University. There was a decrease in 1975 followed by an increase during the late 1970's. The estimated drop at the University of Georgia was three points a year from 1970 to 1979.

The SAT mathematics scores for the total entering freshman group at Georgia State University averaged 465 in 1961 and 470 in 1979. The mean peaked at 490 in 1971 and ebbed to 455 in 1976. The stability of the SAT mathematics scores is shown by the estimated average change in SAT mathematics of 0. The years 1977-1979 show a considerable decrease in students with SAT mathematics scores below 340 (Table B-11). University of Georgia SAT mathematics score distributions show that from 1961 to 1971 the mean of SAT mathematics scores increased to their highest (Table B-12). The scores decreased in 1975 and have increased slightly since then. Taking these changes into account, there was an overall estimated average decrease of two points per year from 1970 to 1979. Changes in SAT mathematics scores over time were quite similar to those at Georgia State University.

The distribution of high school averages for Georgia State University entering freshmen in 1961 shows a mean of 2.86. In 1969 the

the mean was 2.68. For the period from 1970 to 1976, the mean HSA varied from 2.71 in 1974 to the high of 2.82 in 1973. The period from 1977 to 1979 showed the mean increasing from 2.85 to the 2.95 range. It was estimated that the mean HSA increased .015 per year from 1970 to 1979. Some proportion of the total increase in mean HSA is surely attributable to the increasing proportions of female students over time. A review of the distribution of high school averages shows a marked "drop off" in students with average below 1.9 (see Table B-13).

The distribution of high school averages for the University of Georgia freshmen (Table B-14) showed an upward movement from 1961 to 1973. Between 1974 and 1976, high school averages showed a slight drop, and were at their highest between 1977 and 1979. The longitudinal stability of the mean HSA is indicated by the estimated average increase of .003 per year from 1970 to 1979.

The Georgia State University entering freshman group had its lower range of the SAT scores in the mid-1970's as did the University of Georgia. Freshman GPA's from 1970 to 1979 for Georgia State University show that over the period the freshman mean GPA's rose from 2.27 in 1970 to 2.49 in 1975 (Table B-15). The mean for 1979 was 2.34. The mean GPA increased at an estimated average of only .009 per year from 1970 to 1979. This indicates a remarkably homogeneous student population over time.

The University of Georgia distributions show that GPA's increased from 1970 to 1973 and generally have held steady since then (see Table B-16), with an estimated increase per year of .007 from 1970 to 1979. The Georgia State University entering freshman mean GPA's peaked slightly after the time this occurred at the University of Georgia, but on the whole the pattern of the two distributions is quite similar.

Beginning Freshman Progress

Student flow is a topic of great concern in higher education across the nation. In recent years many undergraduate students have slowed their progress through college. This section focuses upon the degree of association between previously discussed indicators and progress during the freshman year. Mean scores for all beginning freshmen are compared with those of beginning freshmen who have attempted 25 hours or more. Ideally, SAT scores or high school averages would be predictive of student progress. The mean SAT verbal scores for males show that only during the years from 1974 to 1976 was there any noticeable difference between the means of the total group and the means of those who had taken 25 or more hours. For example, in 1975 the beginning group had a mean score of 458 compared to 479 for the 25-hour or more group (see Table C-1). From 1978 to 1979, the mean score for those attempting 25 hours or more was only slightly lower than the mean for the total group. The same basic pattern has held for the female groups, with the greatest difference in means occurring in 1975. The same holds true for the total Georgia State University group. The University of Georgia data showed almost no measurable differences in the means of those attempting 25 or more hours.

For SAT median scores, the differences for males were greatest between 1974 and 1975 group. The SAT median scores for females, however, have often shown a wider spread than any other differences. At times the difference was almost 20 points. This finding may indicate that females as a group graduate from high school with fewer mathematics courses and lower achievement levels in mathematics (Galambos, 1980). This suggests that women with lower SAT mathematics scores encounter problems during their freshman year. For the total entering freshman group at Georgia State University, lower SAT mathematics scores are predictive of fewer hours

attempted during the freshman year. At the University of Georgia, the SAT mathematics scores of students indicate a pattern similar to that at Georgia State University, but of less magnitude.

A comparison of the HSA mean of the total group with the mean of those who attempted 25 or more hours reveals that the HSA mean is indeed a more sensitive indicator of progress for both male and female students at Georgia State University than are SAT scores. The group who had higher HSA means achieved higher freshman GPA and also attempted more hours. This same pattern is indicated for all entering freshmen--high HSA's are an indicator of more progress during a student's freshman year at Georgia State University. Neither SAT scores nor HSA's were as indicative of progress at the University of Georgia.

Formulas Predicting Freshman GPA

A key component of the norms booklet has been the prediction equation which is based upon a regression analysis of those entering freshmen who have attempted 25 hours or more. In this process, SAT verbal and mathematics scores along with high school averages are entered in a multiple regression equation with freshman GPA as the dependent variable. The resulting regression coefficients are the basis for the prediction equation. The "error" is the difference between the actual GPA and the predicted GPA. These important equations give a comprehensive multifaceted picture of entering freshman performance. Prior to 1975 separate prediction equations were developed for males and females. A careful study of the regression coefficients revealed the magnitude of factors influencing freshman performance. A comparison of the equations for males and females shows that high school average influenced freshman GPA more strongly for

males than for females (see Table D-1). For instance, in the last year that male and female equations were available, the weight of the high school average for males was .49, compared to a weight for females of .22. Significantly, the weights for the SAT verbal and mathematics scores were higher, generally, for females than for males in a given group. A possible interpretation is that potential as measured by SAT scores weighed more heavily in performance for females, while past performance, as measured by high school averages, more heavily influenced performance for males. The combined equation obscures this difference. From 1976 to 1979, the weight of the high school average grew while the weights for the SAT generally remained steady. To determine the significance of this shift would require separate prediction equations by sex.

The accuracy of these prediction equations has held steady at .6 of a letter grade error for the five-year period from 1975 to 1979. The prediction equations for the University of Georgia group displayed in Table D-2 show a different pattern than is shown for Georgia State University. The male/female differentials found at Georgia State University are not reflected in University of Georgia data. The main difference between the equations for the Georgia State University and the University of Georgia is the weight shown for the SAT verbal score--the Georgia State University SAT verbal weight has been approximately twice as large. This may reflect disproportionately more females in the data for Georgia State University. Additionally, it indicates that the SAT, particularly the verbal component, is more predictive of performance at Georgia State University than at the University of Georgia.

Tables D-3 to D-8 present GPA prediction equations for other University System institutions which have a significant number of their students transferring into Georgia State University, including Georgia Institute of Technology, Clayton Junior College, Kennesaw College, West Georgia College, Georgia Southern, and Atlanta Junior College. An overview of the equations for Georgia State University, the University of Georgia and other institutions in the University System considers an admission question of what factors predict beginning freshman performance during that first year. As the regression coefficients vary across institutions, differential performance may be identified. For instance, Georgia State University has the highest SAT verbal coefficients among these institutions, indicating the relatively high importance of the SAT verbal score of students admitted to this university when compared to students at other referenced institutions. Similarly, with its emphasis on mathematics reflected in its engineering programs, Georgia Institute of Technology has the highest SAT mathematics coefficients (see Galambos, 1980). High school average has the highest weight for freshman performance at Georgia Institute of Technology and Kennesaw College.

The constant term used in the specific regression equation referenced in this study is a measure of freshman GPA, controlling for the impact of SAT scores and high school averages. The lower the constant term, the lower the expected freshman GPA for a given level of ability and experience. Georgia Institute of Technology had the lowest constant term, followed by Georgia State University, Kennesaw College, and West Georgia College. At these institutions, based on this regression equation, students with a given set of SAT scores are predicted to receive lower grades than at other System institutions.

The highest constant term was associated with Atlanta Junior College, though it did fluctuate for this institution. Additionally, Atlanta Junior College had the lowest multiple correlations (R). The general range of multiple R's for a number of System institutions was .60, while at Atlanta Junior College it was substantially less. In recent years, the equations showed the constant terms becoming lower for all System institutions except Atlanta Junior College. This provides evidence to suggest that GPA's of students transferring from Atlanta Junior College would not be comparable to GPA's of native students, or to those GPA's of students transferring from Kennesaw, West Georgia, Georgia Institute of Technology or University of Georgia.

Summary and Implications

This report has described academic performance trends for entering freshmen. The study was based upon the population of beginning freshmen as defined by the publication of the Board of Regents' normative data for freshmen from 1961 to 1979. The measures used in this report include the verbal and mathematics scores of the Scholastic Aptitude Test, high school average, and freshman grade point average.

The key findings of this research were:

- For Georgia State University, SAT verbal and mathematics scores remained generally stable; over time the mean SAT average dropped one point a year. High school averages showed a very slight increase over time of .015 per year in mean HSA. The mean freshman GPA increased slightly, from 2.27 in 1970 to 2.34 in 1979, averaging an increase of .009 per year.

- SAT scores furnished only a slight indication of the progress of freshman students as measured by the amount of hours they took from fall to spring quarters of their freshman year. The association of student progress with high school average was greater than with SAT scores, but it was still at a low level.

- The average difference in mean GPA's between freshmen who attempted less than 25 hours and those who attempted 25 or more hours was .14, suggesting that slow progress relates to poor course grades.

- The relationship of SAT scores and high school averages to freshman mean GPA's suggests that high school averages impact more strongly upon GPA's for males than for females. SAT verbal scores appear to have a stronger impact on grades for females than for males.

- For a given set of SAT scores and high school averages, freshman GPA's have tended to drop since the mid-70's.

  Relative to selected System institutions, freshmen at Georgia State University achieved lower GPA's, controlling for their SAT scores and high school averages.

- The SAT verbal score was more critical for freshman performance at Georgia State University than at other large institutions in the University System of Georgia.

These findings may be addressed to certain policy implications, including:

- GPA's for freshmen across System institutions vary widely for a given ability level, suggesting a need for multiple admissions criteria for transfer students from different institutions applying to Georgia State University.

- To develop prediction equations at Georgia State University for lower division transfer students from major feeder colleges is not out of the realm of possibility, but such a project would require additional financial resources to expand and enhance the present student data base and provide needed technical computer support.

- The atypically high association between SAT verbal scores and performance, independent of high school average, suggests special consideration of students with high SAT verbal scores and low high school averages.

- The slow progress of many freshmen with lower grades in their first 25 hours of coursework may be countered in some cases by tutoring, counseling and special advisement; the cost/benefit ratio for such programs may be unfavorable.

Based upon these findings, it is recommended that if any changes in admissions policy are considered, such changes should be implemented on an experimental basis, with a built-in evaluation system. This approach would allow a comparison with the general student body and an assessment of effectiveness.

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Appendix A

Freshman Population at Georgia State University

The population of beginning freshmen at Georgia State University has always been a small proportion of the freshman class. There have been as many as 1539 in fall quarter 1970, constituting 45% of the total freshman class, and as few as 892 in 1978, or 25% of freshmen (see Table A-1). From 1969 to 1980, the freshman class grew at a robust weighted fitted average (RWFA) of 59 with a female RWFA of 59, while the male RWFA dropped 15 a year. Beginning freshmen have a RWFA indicating a drop of 48 a year from 1969 to 1979. From 1974 to 1980, Developmental Studies had a RWFA growth of 45 a year, with most of this accounted for by the female group which has grown at 38 a year. Male sophomores have a RWFA indicating a drop of 61 a year; juniors have a RWFA indicating a drop of 21 a year. On average, female sophomore enrollment has been growing 45 a year, junior female enrollment at 72 a year, and seniors, at 163 a year. Male seniors had a RWFA of 90 a year.

These data support the conclusion that undergraduate females have been consistently growing from 1969 - 1979, while males as a group have been decreasing, except in the senior class. The decrease in males has no immediate explanation.

Using University of Georgia as a control group, the Special Studies group, which is comparable to Developmental Studies at Georgia State University, shows a RWFA of 36 a year from 1976 to 1980. Beginning freshmen at the University of Georgia have shown a small growth of 8 a year for males and a larger 27 a year for females. The freshman class shows a similar pattern of growth. The sophomore class at Georgia State University has RWFA of -32

with males dropping 61 a year. At the University of Georgia, the sophomore class has been increasing 98 a year. The University of Georgia junior class shows a decreasing male group with a RWFA of -28, while females had a +35, both smaller than the Georgia State University junior class groups. Georgia State University senior class has shown very high growth with a RWFA of 249 while the University of Georgia shows 66. At the University of Georgia, senior males have been decreasing very slightly at -5 RWFA.

The controlled comparisons show that the University of Georgia lower division has been growing while the Georgia State University upper division was growing--especially the senior class.

The RWFA is calculated by using the 1970 - 1979 data as a time series least squares fit (regression) that is iterately fitted to the data. The fit is robust in that the weight of very deviant observations are down-weighted; for example, in Table A-2 the 1974 beginning freshman data for the University of Georgia is obviously incorrect, being much too low. The robust-iterately-weighted-least-squares down weights these data points of extreme deviations so they do not bias the overall regression estimate of average yearly change. A discussion of this technique may be found in Mosteller & Tukey (1977: Chapter 10).

Table A - 1

Georgia State University
Headcount Enrollments Trend by Undergraduate Class and Sex
Fall Quarters 1969 to 1980

Fall Quarter	Developmental Studies			Beginning Freshmen			Freshmen			Sophomores			Juniors			Seniors		
	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T
1980	295	413	708				1560	2053	3613	1060	1444	2504	1312	1625	2937	2069	2317	4386
1979	309	432	741	403	502	905	1551	2046	3557	1046	1441	2487	1367	1604	2971	2122	2212	4334
1978	290	379	669	376	516	892	1473	1929	3402	1146	1499	2645	1431	1475	2906	2019	2126	4145
1977	285	388	673	381	540	921	1697	2359	4056	1114	1451	2565	1476	1484	2960	2022	1792	3814
1976	275	322	597	607	757	1361	1453	1989	3442	1203	1371	2574	1525	1421	2946	1963	1673	3636
1975	276	301	577	534	765	1299	1705	2065	3770	1289	1303	2592	1592	1285	2877	1920	1379	3299
1974	138	142	280	496	687	1183	1587	1949	3536	1311	1155	2466	1380	1140	2520	1636	1202	2838
1973				406	593	999	1238	1625	2863	1343	1230	2573	1538	1058	2596	1507	1084	2591
1972				448	710	1158	1649	1753	3402	1500	1268	2768	1522	1025	2547	1329	802	2131
1971				607	759	1366	1780	1823	3603	1691	1158	2849	1424	957	2381	1598	907	2505
1970				691	848	1539	1854	1614	3452	1711	1067	2792	1687	967	2655	1092	758	1851
1969				668	604	1272	1541	1192	2733	1454	891	2345	1575	938	2513	1293	828	2121
Regression Coefficient	+5	+38	+45	-28	-32	-48	-15	+59	+59	-61	+45	-32	-21	+72	+51	+90	+163	+249
Standard Error	±2	±10	±16	±7	±8	±15	±12	±16	±28	±8	±6	±7	±7	±5	±10	±12	±11	±18
Constant	264	190	449	678	851	1450	1701	1485	3113	1723	982	2859	1623	782	2408	1133	352	1522
r^2	.998	.84	.91	.72	.92	.49	.70	.69	.60	.86	.91	.996	.75	.97	.86	.90	.97	.96

Table A - 2

University of Georgia
Headcount Enrollments Trend by Undergraduate Class and Sex
Fall Quarters 1969 to 1980

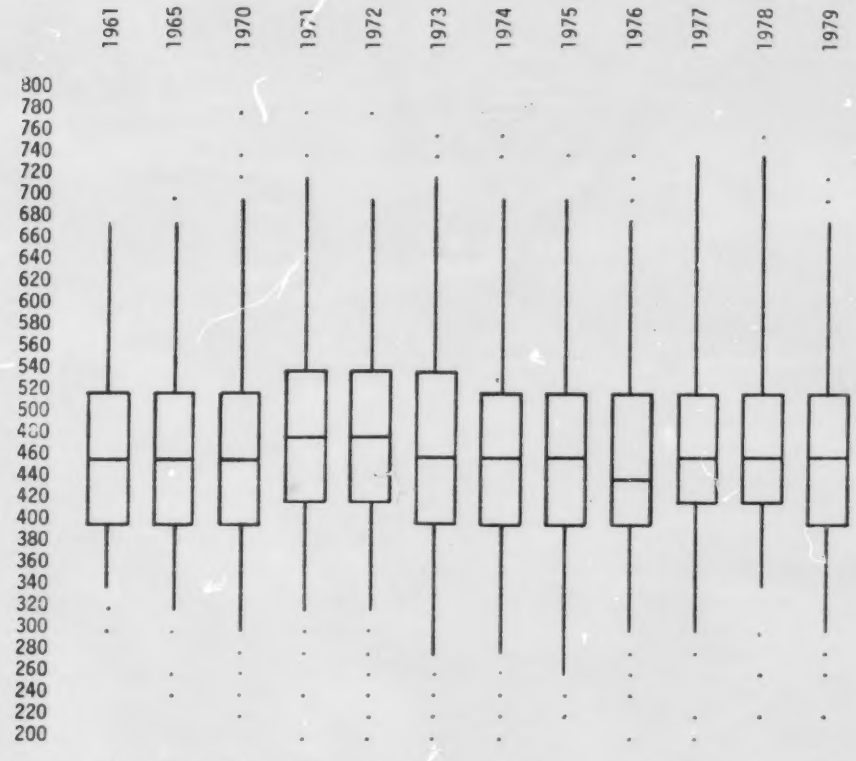
Fall Quarter	Developmental Studies			Beginning Freshmen			Freshmen			Sophomores			Juniors			Seniors		
	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T
1980	176	150	326				1574	1724	3298	1907	1864	3771	1823	1952	3775	2261	2208	4469
1979	183	155	338	1501	1523	3024	1792	1721	3513	1655	1774	3429	2053	2081	4134	2223	2141	4364
1978	169	130	299	1551	1610	3161	1634	1711	3345	1908	1912	3820	2053	1963	4016	2253	2030	4283
1977	164	125	289	1586	1575	3161	1801	1759	3560	1899	1875	3774	2157	1934	4091	2278	1975	4253
1976	109	59	168	1432	1491	2923	1852	1827	3679	1740	1738	3478	2197	1913	4110	2294	1877	4171
1975				1508	1491	2999	1846	1759	3605	1766	1779	3545	2259	1891	4150	2305	1971	4276
1974				827	913	1740	1933	1903	3836	1779	1659	3438	2443	2006	4449	2158	1804	3962
1973				1279	1309	2588	1713	1580	3293	1648	1603	3251	2300	1914	4214	2310	1790	4100
1972				1439	1514	2953	1757	1606	3363	1571	1538	3109	2428	1880	4308	2233	1584	3817
1971				1388	1248	2636	1606	1478	3084	1561	1433	2994	2239	1733	3972	2248	1628	3876
1970				1371	1341	2712	1664	1574	3238	1334	1312	2646	2114	1652	3766	2308	1482	3790
1969				1669	1599	3268	1539	1461	3000	1437	1391	2828	2273	1571	3844	2352	1457	3809
Regression Coefficient	+15	+21	+36	+8	+27	+43	+9	+25	+35	+47	+52	+98	-28	+35	+8	-5	+68	+66
Standard Error	±6	±7	±14	±10	±10	±19	±11	±6	±18	±6	±6	±14	±11	±7	±18	±3	±4	±5
Constant	115	61	176	1429	1284	2642	1666	1484	3162	1406	1319	2717	2381	1646	4014	2314	1386	3642
r^2	.73	.79	.76	.97	.98	.98	.32	.98	.23	.99	.88	.90	.90	.82	.83	.99	.98	.999

Appendix B

Distributions of Beginning Freshman Academic Measures

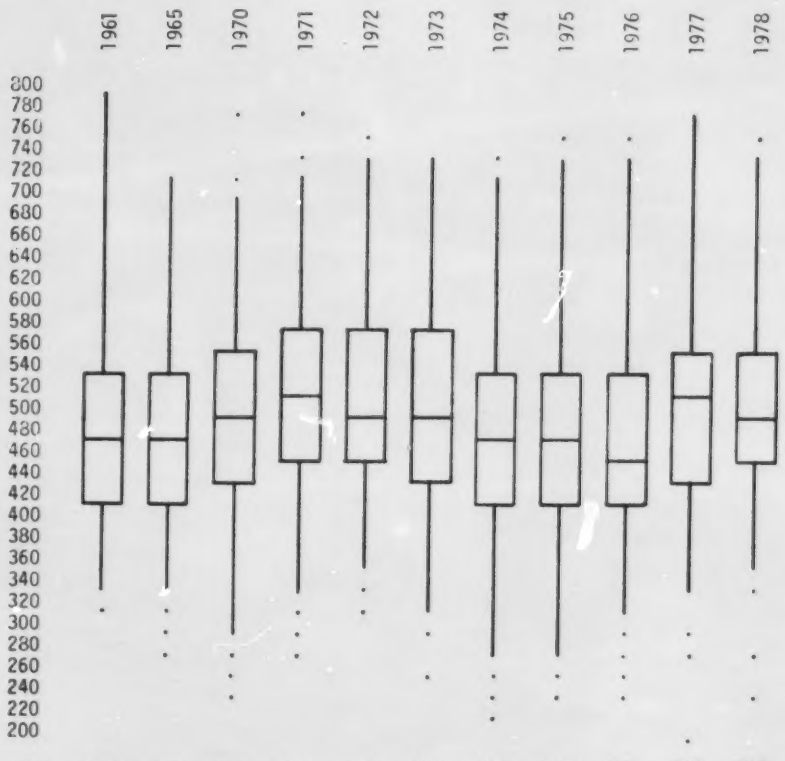
The distribution of scores and averages are displayed using the graph method of box and whisker plots. This simple method shows,at a quick glance, the quartiles of a given distribution. The box in the middle of the distribution shows the ranges of 50% of the students in the population. The line in the box gives the median. The upper line or "whisker" shows the upper 25% of the distribution while the lower line shows the bottom 25% of the distribution. For the purposes of this analysis, the upper whisker stops at the 99th percentile, and the bottom whisker stops at the one percentile. Thus, the box and whisker technique allows the ranges of distribution to be evident quickly, and shows major shifts in the distribution from year to year. The means of the scores and averages are sensitive to the smallest or most minute yearly changes.

Table B-1
Georgia State University
Distribution of SAT-Verbal Scores for Male Freshmen
Beginning Fall Quarters, for Selected Years, 1961 - 1979



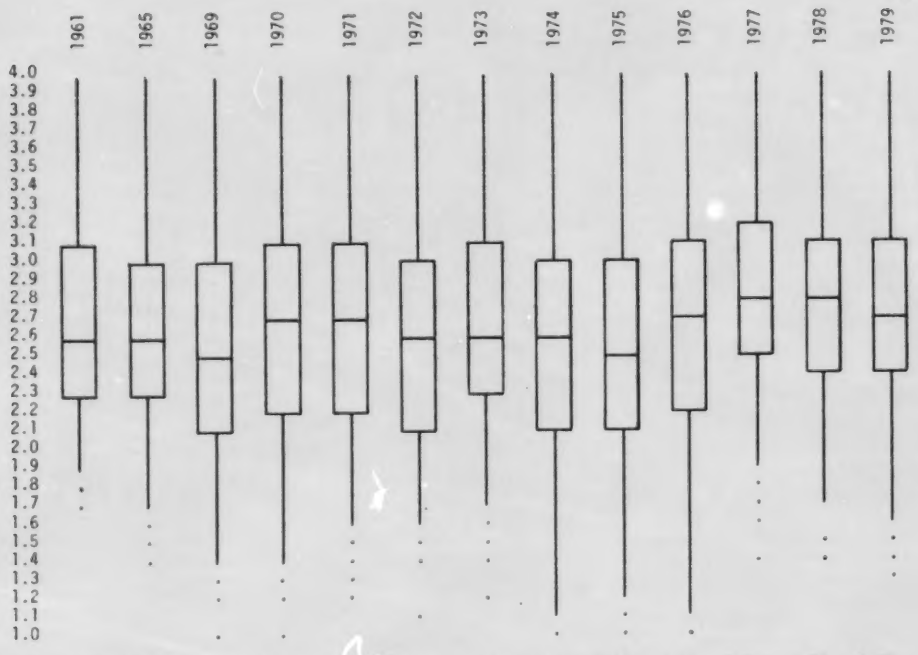
	1961	1965	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979
Mean	464	459	463	482	476	468	454	458	449	468	469	459
SD	75	85	88	88	88	98	91	95	86	87	81	82
N	102	509	691	607	448	406	496	534	604	381	376	403

Table B-2
Georgia State University
Distribution of SAT-Mathematics Scores for Male Freshmen
Beginning Fall Quarters, for Selected Years, 1961 - 1979



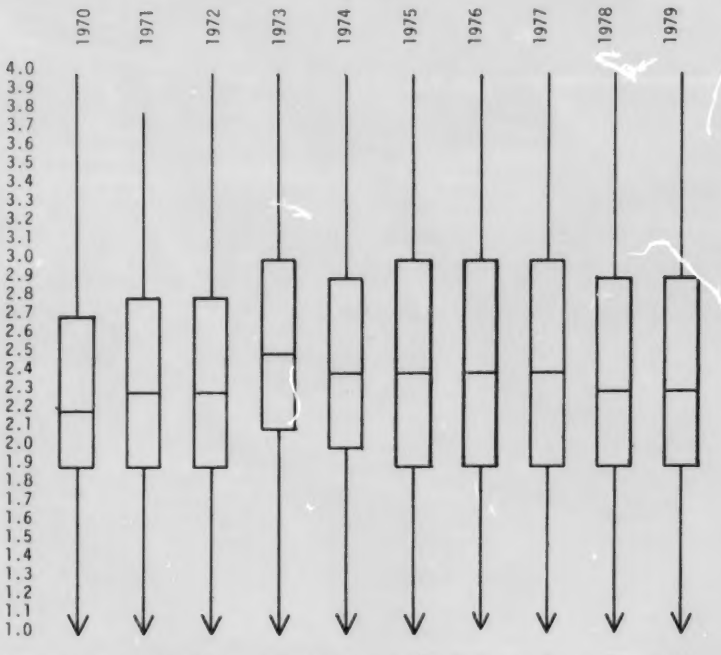
	1961	1965	1970	1971	1972	1973	1974	1975	1976	1977	1978
Mean	479	486	494	517	510	503	480	483	475	508	504
SD	82	86	87	88	85	100	97	94	94	90	78
N	102	509	691	607	448	406	496	534	604	381	376

Table B-3
Georgia State University
Distribution of High School Averages for Male Freshmen
Beginning Fall Quarters, for Selected Years, 1961 - 1979



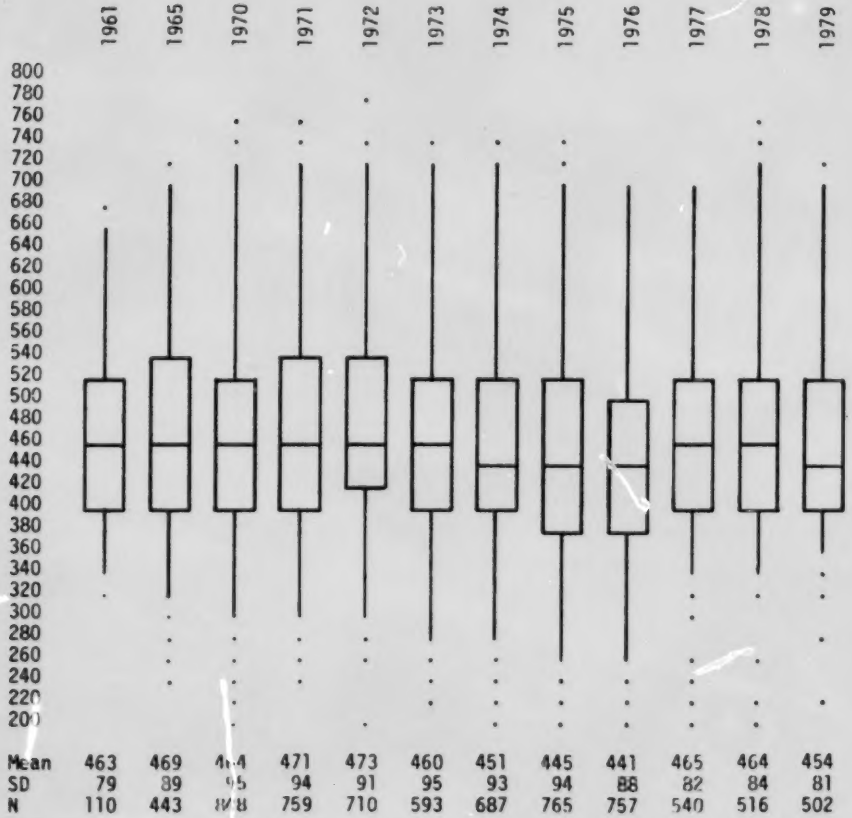
	1961	1965	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979
Mean	2.66	2.62	2.51	2.61	2.61	2.54	2.64	2.47	2.50	2.58	2.80	2.74	2.69
SD	.51	.52	.57	.6	.5	.55	.54	.65	.62	.63	.50	.51	.54
N	102	509	668	691	607	448	406	496	534	604	381	376	403

Table B-4
Georgia State University
Distribution of High School Averages for Male Freshmen
Beginning Fall Quarters, 1970 - 1979



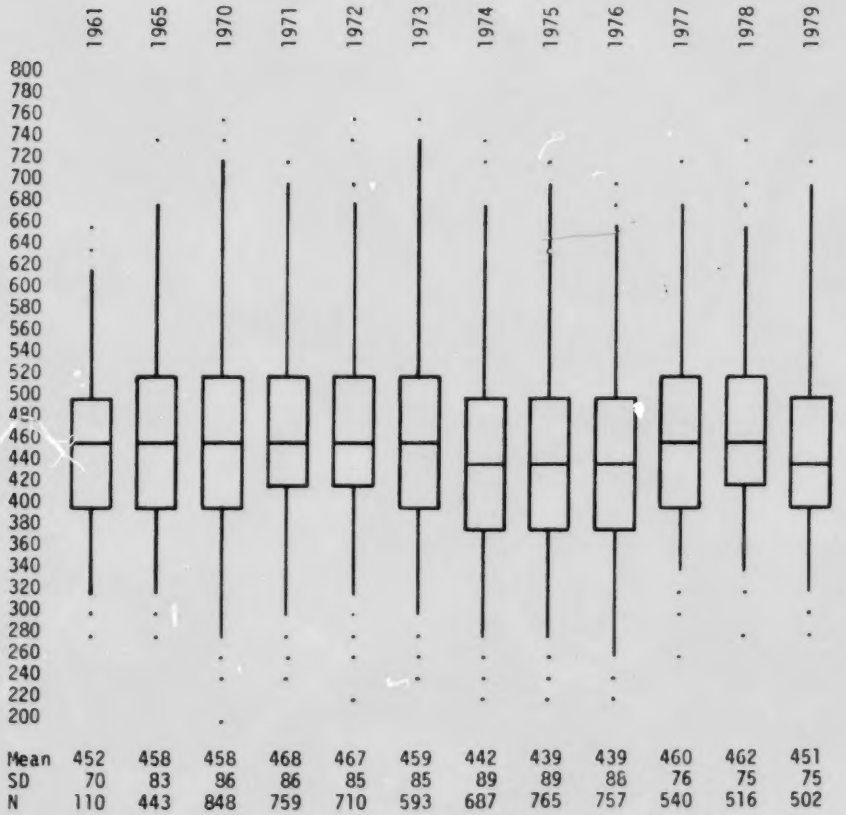
	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979
Mean	2.19	2.25	2.26	2.41	2.39	2.41	2.31	2.35	2.31	2.28
SD	.64	.67	.70	.76	.68	.76	.76	.73	.77	.74
N	478	407	319	286	282	319	363	267	248	273

Table B-5
Georgia State University
Distribution of SAT-Verbal Scores for Female Freshmen
Beginning Fall Quarters, for Selected Years, 1961 - 1979



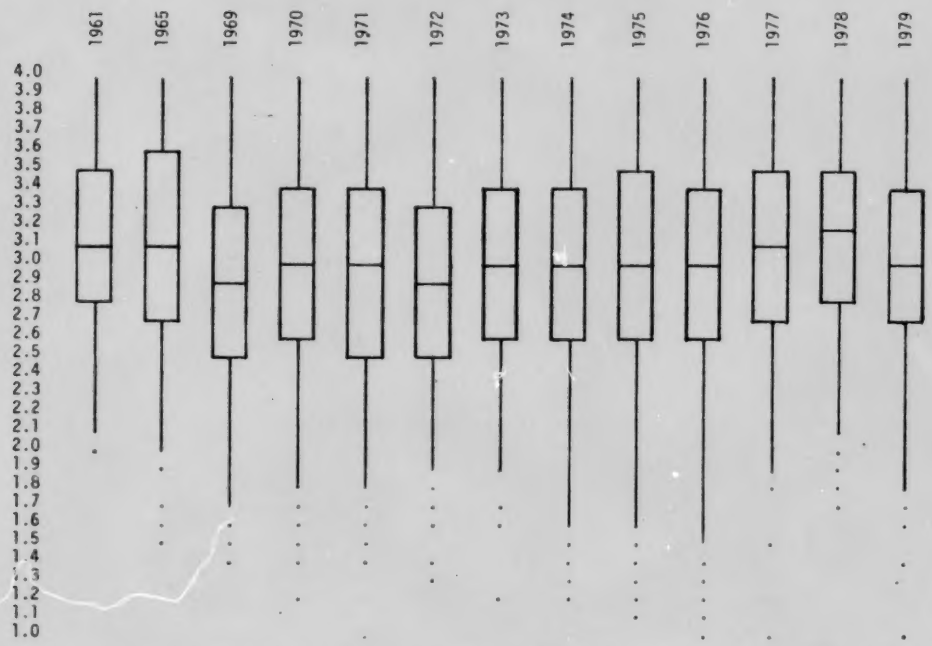
	1961	1965	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979
Mean	463	469	464	471	473	460	451	445	441	465	464	454
SD	79	89	95	94	91	95	93	94	88	82	84	81
N	110	443	848	759	710	593	687	765	757	540	516	502

Table B-6
Georgia State University
Distribution of SAT-Mathematics Scores for Female Freshmen
Beginning Fall Quarters, for Selected Years, 1961 - 1979



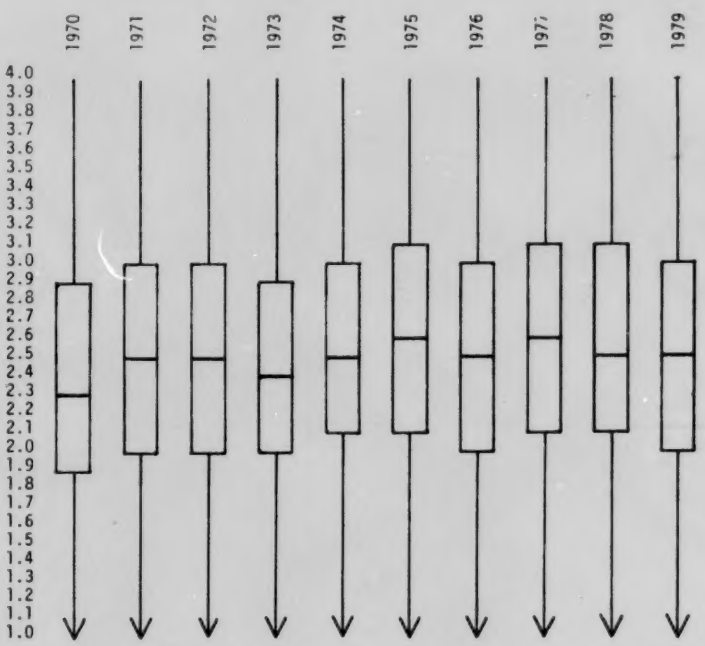
	1961	1965	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979
Mean	452	458	458	468	467	459	442	439	439	460	462	451
SD	70	83	86	86	85	85	89	89	88	76	75	75
N	110	443	848	759	710	593	687	765	757	540	516	502

Table B-7
Georgia State University
Distribution of High School Averages for Female Freshmen
Beginning Fall Quarters, for Selected Years, 1961 - 1979



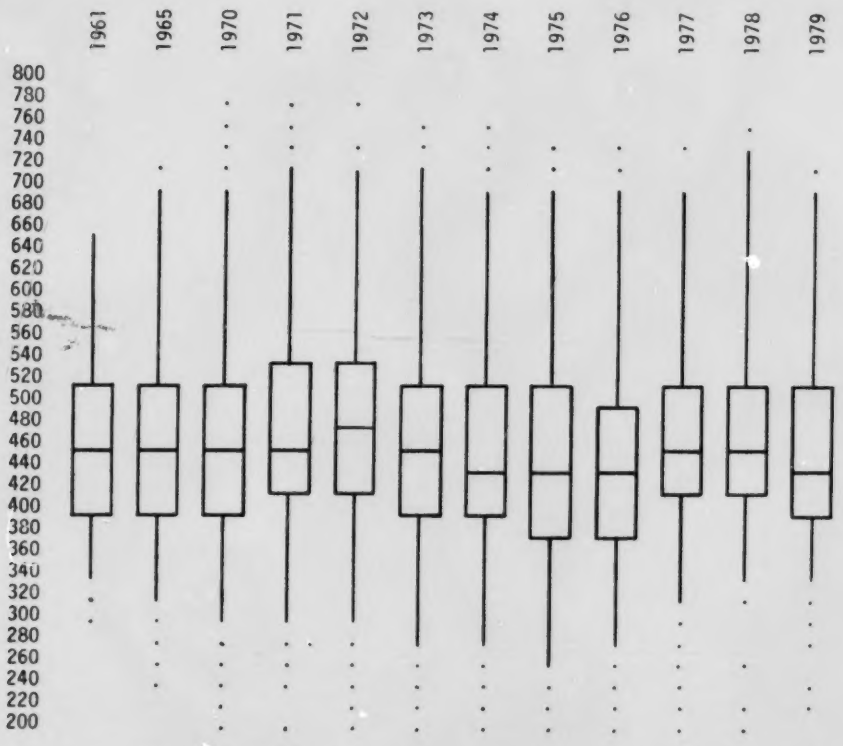
	1961	1965	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979
Mean	3.05	3.07	2.87	2.92	2.91	2.86	2.94	2.89	2.92	2.93	3.01	3.10	2.96
SD	.51	.55	.57	.57	.57	.56	.52	.57	.61	.59	.54	.46	.53
N	110	443	604	848	759	710	593	687	765	757	540	516	502

Table B-8
Georgia State University
Distribution of Grade Point Averages for Female Freshmen
Beginning Fall Quarters, 1970 - 1979



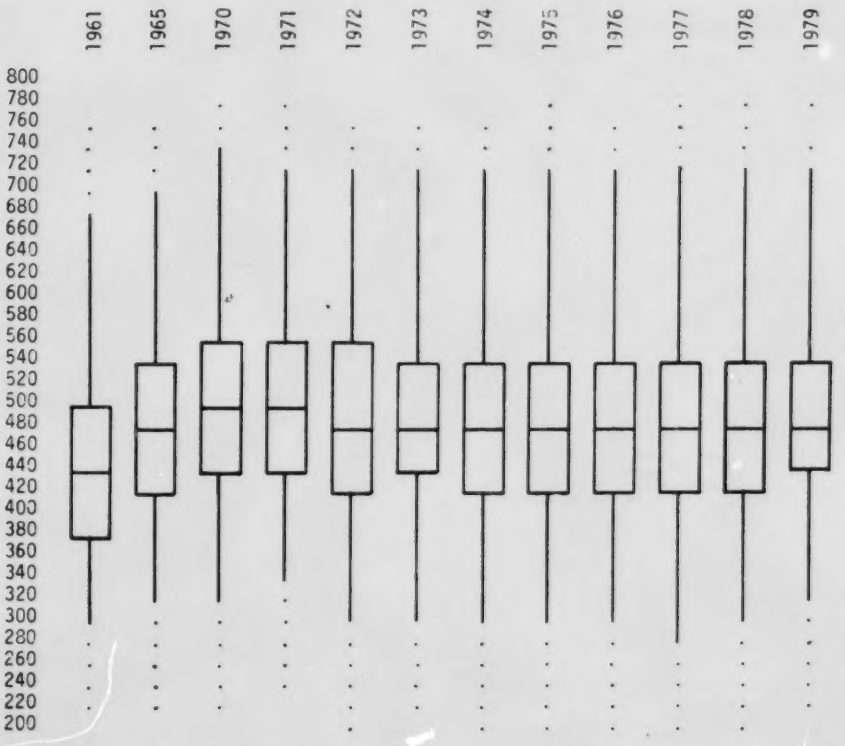
	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979
Mean	2.34	2.42	2.44	2.38	2.51	2.56	2.43	2.49	2.50	2.39
SD	.69	.70	.72	.67	.66	.72	.70	.69	.76	.76
N	574	458	447	353	377	365	426	332	296	301

Table B-9
Georgia State University
Distribution of SAT-Verbal Scores for Total Freshmen
Beginning Fall Quarters, for Selected Years, 1961 - 1979



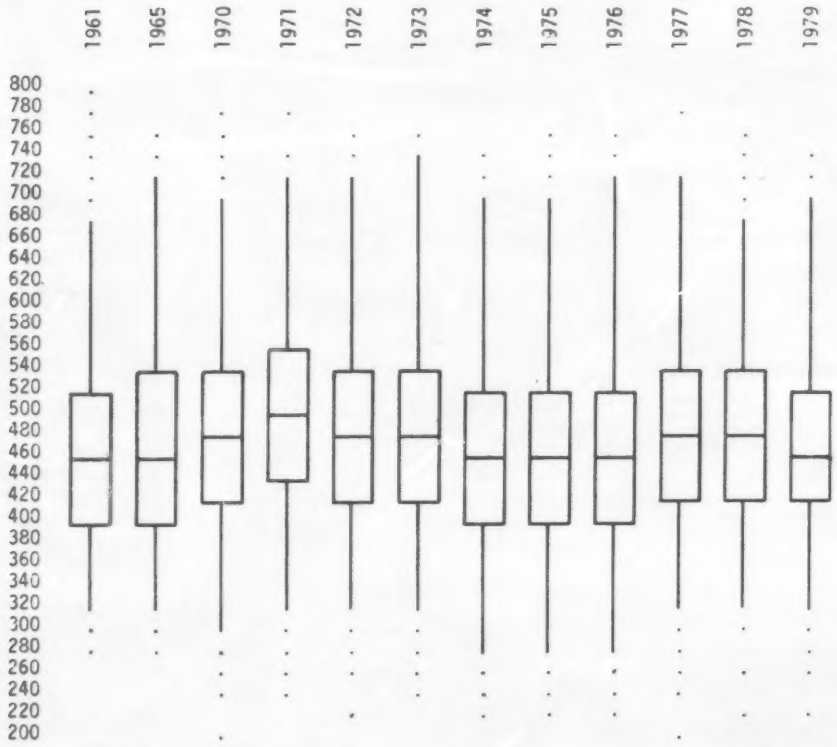
	1961	1965	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979
Mean	464	464	463	476	474	463	452	450	445	466	466	456
SD	77	87	92	92	90	96	92	94	87	84	83	82
N	212	952	1539	1366	1158	999	1183	1299	1361	921	892	905

Table B-10
University of Georgia
Distribution of SAT-Verbal Scores for Total Freshmen
Beginning Fall Quarters, for Selected Years, 1961 - 1979



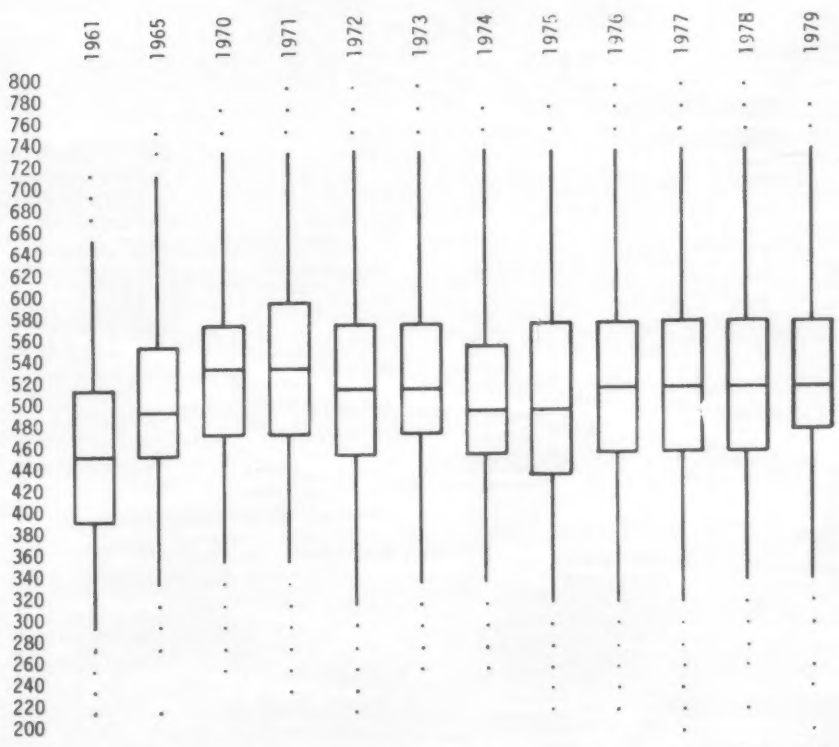
	1961	1965	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979
Mean	443	484	507	504	486	486	476	470	474	473	478	481
SD	88	88	88	87	94	87	88	90	87	89	86	82
N	1493	1995	2712	2636	2953	2588	1740	2999	2923	3161	3161	3024

Table B-11
Georgia State University
Distribution of SAT-Mathematics Scores for Total Freshmen
Beginning Fall Quarters, for Selected Years, 1961 - 1979



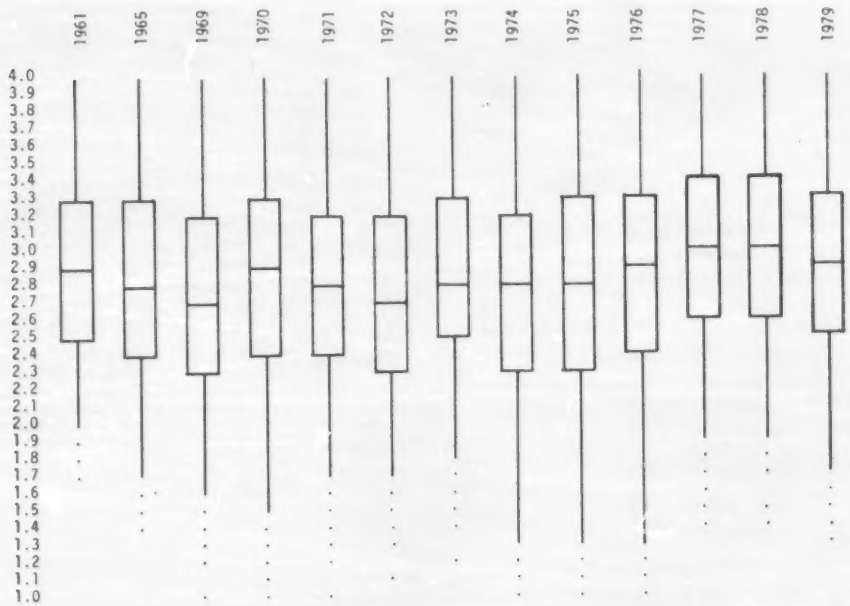
	1961	1965	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979
Mean	465	473	474	490	484	477	458	457	455	480	480	470
SD	77	85	88	90	88	94	94	93	92	85	79	79
N	212	952	1539	1366	1158	999	1183	1299	1361	921	892	905

Table B-12
University of Georgia
Distribution of SAT-Mathematics Scores for Total Freshmen
Beginning Fall Quarters, for Selected Years, 1961 - 1979



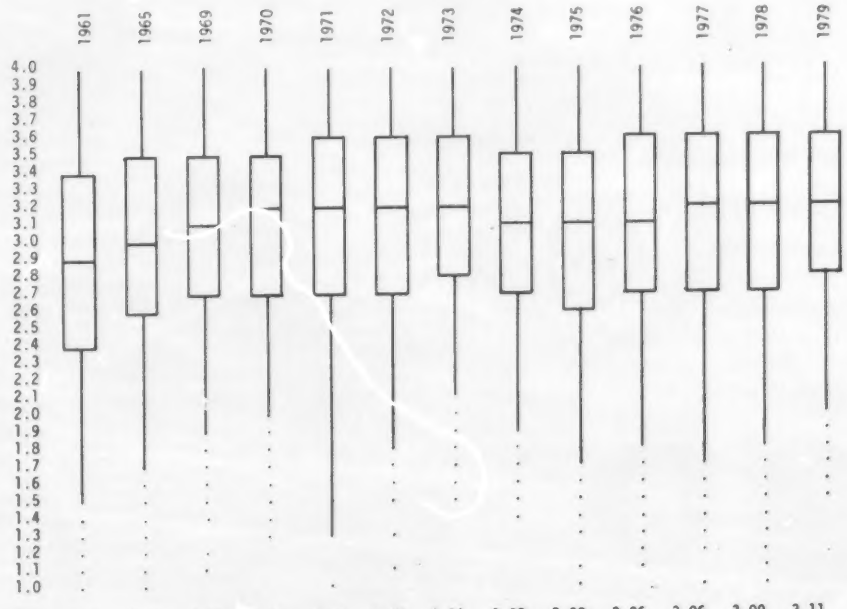
	1961	1965	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979
Mean	456	502	530	532	517	523	507	506	510	510	515	522
SD	83	84	82	80	90	84	88	91	89	91	84	81
N	1493	1995	2712	2636	2953	2588	1740	2999	2923	3161	3161	3024

Table B-13
Georgia State University
Distribution of High School Averages for Total Freshmen
Beginning Fall Quarters, for Selected Years, 1961 - 1979



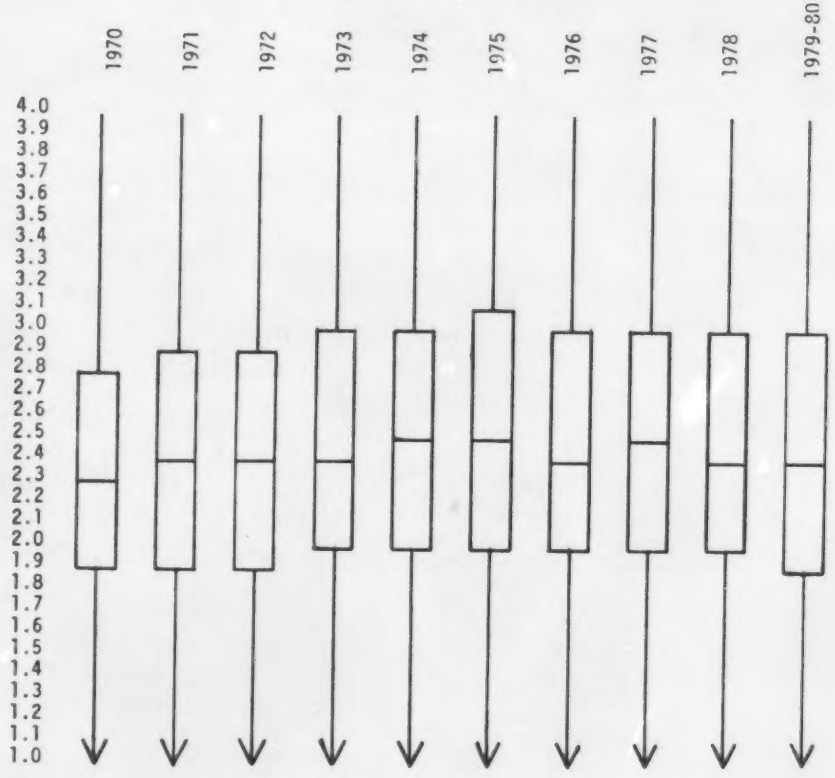
	1961	1965	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979
Mean	28.6	2.83	2.68	2.78	2.78	2.74	2.82	2.71	2.75	2.77	2.93	2.95	2.84
SD	.54	.58	.60	.60	.58	.58	.55	.64	.64	.63	.53	.51	.55
N	212	952	1272	1539	1366	1158	999	1183	1299	1361	921	892	905

Table B-14
University of Georgia
Distribution of High School Averages for Total Freshmen
Beginning Fall Quarters, for Selected Years, 1961 - 1969



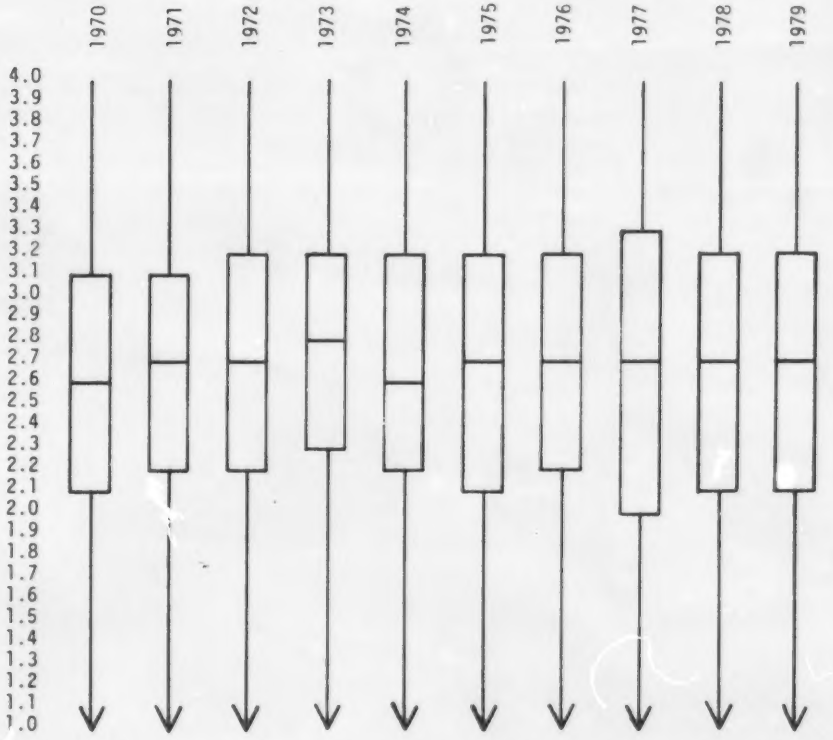
	1961	1965	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979
Mean	2.81	2.98	3.00	3.07	3.03	3.08	3.11	3.02	2.99	3.06	3.06	3.09	3.11
SD	.68	.61	.55	.54	.72	.57	.51	.54	.58	.56	.58	.58	.53
N	1493	1995	3268	2712	2636	2953	2588	1740	2999	2923	3161	3161	3024

Table B-15
Georgia State University
Distribution of Grade Point Averages for Total Freshmen
Beginning Fall Quarters, 1970 - 1979



	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979-80
Mean	2.27	2.34	2.36	2.39	2.46	2.49	2.37	2.43	2.41	2.34
SD	.67	.69	.72	.71	.67	.74	.73	.71	.77	.76
N	1052	865	766	639	659	684	789	599	544	574

Table B-16
University of Georgia
Distribution of Grade Point Averages for Total Freshmen
Beginning Fall Quarters, 1970 - 1979



	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979
Mean	2.52	2.61	2.60	2.68	2.59	2.61	2.60	2.59	2.64	2.65
SD	.71	.67	.68	.70	.69	.72	.74	.79	.73	.71
N	2536	2380	2683	2437	1564	2656	2723	2990	2927	2764

Appendix C

Statistics for Beginning Freshmen, 1970 - 1979

This Appendix allows the comparison of those beginning freshmen for 1970 - 1979 who completed 25 or more credit hours in three quarters with those who did not. Table C-1 displays data on means, standard deviations, and group sizes (N's). Table C-2 shows the trend from 1970 to 1979 in the statistical measures given in Table C-1. The robust weighted fitted average (RWFA) estimates of yearly change are given in Table C-2. These estimates of yearly change show the following:

- At Georgia State University, mean SAT's dropped an average of one point a year while at the University of Georgia the mean SAT's dropped two to three points a year.
- At Georgia State University the drop in mean SAT's was greater for those who had attempted over 25 hours than for those who did not. A continuation of this trend seems undesirable.
- The standard deviations for SAT's have all been dropping at the rate of one point per year, indicating that fewer students with very high and very low SAT's are admitted. The mean HSA's show the same pattern.
- The standard deviations for freshman GPA's have been increasing slightly, indicating an increased range of very high and/or very low GPA's.
- The size of Georgia State University's entering freshman class has been decreasing an average of 58 per year, while those attempting 25 or more credit hours has been decreasing at 34 per year, with the number of females decreasing faster than males.

Table C - 1

Statistics for Beginning Freshmen for 1970 to 1979
Scholastic Aptitude Test, High School Average, and Grade Point Average

Scholastic Aptitude Test, Verbal

	Georgia State University																University of Georgia					
	Males						Females						Total				Total					
	Mean		Std. Dev.		N		Mean		Std. Dev.		N		Mean		Std. Dev.		N		Mean		Std. Dev.		N	
	T	25+	T	25+	T	25+	T	25+	T	25+	T	25+	T	25+	T	25+	T	25+	T	25+	T	25+	T	25+
1979	459	455	82	79	403	273	454	452	81	84	502	301	456	454	82	82	905	574	481	483	82	80	3024	2764
1978	469	465	81	81	376	248	464	464	84	84	516	296	466	464	83	82	892	544	478	480	86	85	3161	2927
1977	468	470	87	82	381	267	465	459	82	77	540	332	466	464	84	80	921	599	473	473	89	89	3161	2990
1976	449	458	86	83	604	363	441	451	88	84	757	426	445	454	87	84	1361	789	474	475	87	87	2923	2723
1975	458	479	95	88	534	319	445	463	94	87	765	365	450	470	94	88	1299	684	470	472	90	89	2999	2656
1974	454	471	91	85	496	282	451	458	93	89	687	377	452	463	92	88	1183	659	476	478	88	88	1740	1564
1973	468	475	98	94	406	286	460	464	95	96	593	353	463	468	96	95	999	639	486	486	87	87	2588	2437
1972	476	476	88	84	448	319	473	475	91	92	710	447	474	476	90	88	1158	766	486	488	94	93	2953	2683
1971	482	485	88	88	607	407	471	475	94	96	759	458	476	479	92	92	1366	865	504	505	87	87	2636	2380
1970	463	467	88	87	691	478	464	469	95	95	848	574	463	468	92	91	1539	1052	507	508	88	87	2712	2536
Scholastic Aptitude Test, Math																								
1979	494	494	78	79	403	273	451	460	75	79	502	301	470	476	79	80	905	574	522	527	81	78	3024	2764
1978	504	507	78	78	376	248	462	469	75	79	516	296	480	486	79	81	892	544	515	517	84	83	3161	2927
1977	508	512	90	85	381	267	460	465	76	76	540	332	480	486	85	84	921	599	510	512	91	91	3161	2990
1976	475	490	94	91	604	363	439	457	88	85	757	426	455	472	92	89	1361	789	510	511	89	89	2923	2723
1975	483	504	94	87	534	319	439	460	89	85	765	365	457	481	93	89	1299	689	506	509	91	90	2999	2656
1974	480	504	97	93	496	282	442	462	89	88	687	377	457	480	94	92	1183	659	507	509	88	88	1740	1564
1973	503	516	100	98	406	286	459	469	85	86	593	353	477	490	94	95	999	639	523	525	84	84	2588	2437
1972	510	511	85	86	448	319	467	478	85	86	710	447	483	492	88	87	1158	766	517	521	90	88	2953	2683
1971	517	520	88	87	607	407	468	473	86	87	759	458	490	495	90	90	1366	865	531	533	80	79	2636	2380
1970	494	505	87	83	691	478	458	466	86	87	848	574	474	484	88	87	1539	1052	530	531	82	81	2712	2536
High School Average																								
1979	2.69	2.75	.54	.51	403	273	2.96	3.02	.53	.49	502	301	2.84	2.89	.55	.52	905	574	3.11	3.15	.53	.51	3024	2764
1978	2.74	2.81	.51	.52	376	248	3.10	3.17	.46	.44	516	296	2.95	3.01	.51	.51	892	544	3.09	3.11	.58	.57	3161	2927
1977	2.80	2.85	.50	.49	381	267	3.01	3.10	.54	.49	540	332	2.93	2.99	.53	.51	921	599	3.06	3.07	.58	.57	3161	2990
1976	2.58	2.73	.63	.57	604	363	2.93	3.04	.59	.53	757	426	2.77	2.90	.63	.57	1361	789	3.06	3.07	.56	.56	2923	2723
1975	2.50	2.68	.62	.61	534	319	2.92	3.09	.61	.54	765	365	2.75	2.90	.64	.61	1299	684	2.99	3.02	.58	.57	2999	2656
1974	2.47	2.70	.65	.54	496	282	2.89	2.99	.57	.55	687	377	2.71	2.86	.64	.56	1183	659	3.02	3.03	.54	.54	1740	1564
1973	2.64	2.70	.54	.55	406	286	2.94	2.98	.52	.50	593	353	2.82	2.85	.55	.54	999	639	3.11	3.12	.51	.51	2588	2437
1972	2.54	2.57	.55	.56	448	319	2.86	2.91	.56	.55	710	447	2.74	2.77	.58	.58	1158	766	3.08	3.10	.57	.55	2953	2683
1971	2.63	2.68	.55	.55	607	407	2.91	2.97	.57	.57	759	458	2.78	2.83	.58	.58	1366	865	3.03	3.05	.72	.69	2636	2380
1970	2.61	2.68	.60	.58	691	478	2.92	2.96	.57	.57	848	574	2.78	2.83	.60	.59	1539	1052	3.07	3.08	.54	.54	2712	2536
Grade Point Average																								
1979	2.11	2.28	.97	.74	403	273	2.29	2.39	.92	.76	502	301	2.21	2.34	.95	.76	905	574	2.60	2.65	.77	.71	3024	2764
1978	2.10	2.31	.95	.77	376	248	2.36	2.50	.98	.76	516	296	2.25	2.41	.98	.77	892	544	2.59	2.64	.80	.73	3161	2927
1977	2.24	2.35	.90	.73	381	267	2.43	2.49	.85	.69	540	332	2.35	2.43	.87	.71	921	599	2.55	2.59	.82	.79	3161	2990
1976	2.14	2.31	.76	.96	604	363	2.31	2.43	.90	.70	757	426	2.24	2.37	.93	.73	1361	789	2.55	2.60	.79	.74	2923	2723
1975	2.16	2.41	.76	.92	534	319	2.33	2.56	.93	.72	765	365	2.26	2.49	.93	.74	1299	684	2.54	2.61	.79	.72	2999	2656
1974	2.31	2.39	.77	.68	496	282	2.46	2.51	.82	.66	687	377	2.40	2.46	.81	.67	1183	659	2.56	2.59	.72	.69	1740	1564
1973	2.30	2.41	.80	.76	406	286	2.35	2.38	.76	.67	593	353	2.33	2.39	.77	.71	999	639	2.66	2.68	.72	.70	2588	2437
1972	2.21	2.26	.75	.70	448	319	2.38	2.44	.78	.72	710	447	2.31	2.36	.77	.72	1158	766	2.57	2.60	.71	.68	2953	2683
1971	2.03	2.25	.94	.67	607	407	2.23	2.42	.92	.70	759	458	2.14	2.34	.93	.69	1366	865	2.53	2.61	.79	.67	2636	2380
1970	1.92	2.19	.89	.64	691	478	2.14	2.34	.88	.69	848	574	2.04	2.27	.89	.67	1539	1052	2.48	2.52	.78	.71	2712	2536

Note: T = total
25+ = those beginning freshmen who attempted 25 or more hours

Table C - 2

Trends in Statistics for Beginning Freshmen Calculated for 1970 - 1979 Using a Robust Weighted Fitted Regression

Scholastic Aptitude Test, Verbal

	Georgia State University												University of Georgia			
	Males				Females				Total				Total			
	b	SE	Con.	r^2	b	SE	Con.	r^2	b	SE	Con.	r^2	b	SE	Con.	r^2
Mean-Total	-1	±1	472	.75	-1	±1	467	.78	-1	±1	469	.65	-3	±1	501	.77
Mean-25+ Hrs.	-2	±1	482	.934	-2	±1	474	.96	-2	±1	477	.90	-3	±1	502	.75
SD-Total	-1	±1	92	.78	-2	±1	98	.84	-1	±1	95	.99	0	±1	90	.85
SD-25+ Hrs.	-1	±1	88	.999	-2	±1	98	.99	-1	±1	93	.997	0	±1	90	.86
N-Total	-26	±9	635	.53	-36	±5	844	.98	-58	±17	1474	.60	+52	±15	2622	.98
N-25+ Hrs.	-18	±6	420	.49	-22	±3	503	.99	-34	±9	882	.82	+51	±12	2401	.98
Scholastic Aptitude Test, Math																
Mean-Total	-1	±2	503	.65	-1	±1	461	.78	-1	±1	479	.70	-2	±1	527	.96
Mean-25+ Hrs.	-2	±1	515	.90	-1	±1	472	.91	-1	±1	491	.92	-2	±1	529	.98
SD-Total	-1	±1	94	.11	-1	±1	90	.44	-1	±1	94	.34	0	±1	84	.34
SD-25+ Hrs.	-1	±1	91	.00	-1	±1	90	.97	-1	±1	93	.26	0	±1	84	.70
N-Total	-26	±9	635	.53	-36	±5	844	.98	-56	±17	1473	.60	+52	±15	2622	.98
N-25+ Hrs.	-18	±6	420	.49	-22	±3	503	.99	-35	±11	882	.92	+51	±15	2400	.98
High School Average																
Mean-Total	+.014	±.01	2.55	.81	+.011	±.005	2.87	.99	+.015	±.77	2.72	.63	+.003	±.004	3.04	.99
Mean-25+ Hrs.	+.016	±.006	2.63	.96	+.021	±.006	2.91	.99	+.019	±.006	2.78	.99	+.004	±.005	3.05	.96
SD-Total	-.005	±.006	.59	.00	-.004	±.002	.57	.994	-.006	±.005	.61	.00	+.002	±.003	.54	.98
SD-25+ Hrs.	-.007	±.001	.58	.998	-.01	±.003	.58	.95	-.009	±.002	.59	.99	+.003	±.563	.58	.24
N-Total	-26	±9	635	.53	-36	±5	844	.98	-58	±17	1474	.60	+52	±15	2622	.98
N-25+ Hrs.	-18	±6	420	.49	-22	±3	503	.99	-34	±9	882	.82	+51	±15	2401	.98
Grade Point Average																
Mean-Total	+.008	±.013	2.1	.60	+.013	±.010	2.26	.75	+.011	±.012	2.18	.59	+.008	±.004	2.51	.994
Mean-25+ Hrs.	+.009	±.008	2.26	.51	+.009	±.007	2.39	.91	+.009	±.006	2.32	.99	+.007	±.003	2.56	.999
SD-Total	+.009	±.009	.80	.11	+.009	±.008	.82	.48	+.012	±.008	.82	.51	+.005	±.004	.74	.50
SD-25+ Hrs.	+.012	±.008	.66	.83	+.006	±.003	.67	.58	+.009	±.002	.67	.97	+.006	±.003	.68	.83
N-Total	-26	±9	635	.53	-36	±5	844	.98	-58	±17	1474	.60	+52	±15	2622	.98
N-25+ Hrs.	-18	±6	420	.49	-22	±3	503	.99	-34	±9	882	.82	+51	±15	2400	.98

NOTES: b = Regression coefficient
SE = Standard error
N = Number
Table based upon statistics from Table C-1

Appendix D

Prediction Equations for Selected University System Institutions

These prediction equations are from the yearly norm booklets of the University System. They are based upon those beginning freshmen who have completed 25 or more credit hours. The "dependent" variable is freshman GPA. SAT's and HSA's are the "independent" variables in the multiple regression. The goodness-of-fit is measured by the Multiple R. The standard error of estimate (SEE) shows the average "error" between predicted and actual GPA's. An occasional anomaly appears in this data, such as the negative coefficients in some equations for one of the SAT scores. The import of this is not clear, but in most cases may be due to sampling variability, since negative coefficients do not appear consistently from year to year.

Table D - 1

Predictive Equations for Grade Point Averages for Beginning Freshmen Attempting 25 or More Hours, Fall through Spring Quarters 1970-71 - 1979-80

Georgia State University

Year	SAT Verbal	SAT Math	High School GPA	Constant	SEE	R	N
			Total				
1979-80	.0029	.0013	.5401	-1.1275	.63		574
1978-79	.0026	.0019	.5737	-1.4739	.59	.64	544
1977-78	.0028	.0013	.4590	-.8843	.59	.56	599
1976-77	.0023	.0016	.3750	-.5137	.62	.53	739
1975-76	.0028	.0013	.4027	-.6089	.60	.60	684
			Males				
1975-76	.0024	.0013	.4879	-.6698	.61	.60	319
1974-75	.0018	.0010	.3856	-.0076	.59	.51	282
1973-74	.0020	.0020	.3081	-.3690	.55	.61	286
1972-73	.0020	.0014	.4847	-.6403	.56	.61	319
1971-72	.0022	.0008	.4532	-.4514	.55	.58	407
1970-71	.0019	.0011	.3687	-.2040	.53	.56	478
			Females				
1975-76	.0033	.0017	.2194	-.4884	.57	.61	
1974-75	.0025	.0009	.1769	+.4011	.58	.50	377
1973-74	.0029	.0013	.3440	-.5727	.57	.61	353
1972-73	.0024	.0015	.4202	-.6476	.56	.63	447
1971-72	.0025	.0014	.4364	-.6840	.53	.66	458
1970-71	.0025	.0020	.2855	-.6081	.52	.66	574

SEE: Standard Error of Estimate
R: Multiple Correlation

NOTE: Based upon the Normative Data books published by the Regents of the University System of Georgia, Atlanta.

Table D - 2

Predictive Equations for Grade Point Averages for Beginning Freshmen Attempting 25 or More Hours, Fall through Spring Quarters 1970-71 - 1979-80

University of Georgia

Year	SAT Verbal	SAT Math	High School GPA	Constant	SEE	R	N
			Total				
1979-80	.0014	.0014	.6220	-.7140	.57		2764
1978-79	.0011	.0011	.5886	-.2972	.59	.58	2927
1977-78	.0017	.0015	.6110	-.8730	.60	.65	2990
1976-77	.0020	.0014	.5635	-.7968	.57	.64	2773
1975-76	.0016	.0015	.5617	-.5963	.53	.65	2656
			Males				
1975-76	.0015	.0016	.5396	-.5540	.57	.64	1348
1974-75	.0017	.0013	.5437	-.5544	.54	.63	758
1973-74	.0020	.0013	.5209	-.6105	.56	.58	1221
1972-73	.0016	.0011	.5035	-.3542	.59	.58	1320
1971-72	.0017	.0009	.3220	.2164	.60	.63	1251
1970-71	.0015	.0016	.5026	-.6906	.57	.57	1286
			Females				
1975-76	.0017	.0017	.5305	-.6358	.51	.66	1308
1974-75	.0016	.0015	.4864	-.3686	.54	.60	806
1973-74	.0020	.0005	.5926	-.3805	.56	.58	1216
1972-73	.0017	.0011	.5220	-.3807	.51	.60	1363
1971-72	.0019	.0011	.2913	.2565	.54	.57	1129
1970-71	.0016	.0017	.4860	-.6315	.59	.55	1250

SEE: Standard Error of Estimate
R: Multiple Correlation

NOTE: Based upon the Normative Data books published by the Regents of the University System of Georgia, Atlanta.

Table D - 3

Predictive Equations for Grade Point Averages for Beginning Freshmen Attempting 25 or More Hours, Fall through Spring Quarters 1970-71 - 1979-80

Georgia Institute of Technology

Year	SAT Verbal	SAT Math	High School GPA	Constant	SEE	R	N
			Total				
1979-80							
1978-79	.0002	.0034	.6505	-2.0029	.62	.56	2036
1977-78	.0002	.0030	.7406	-2.0081	.59	.61	2063
1976-77	.0005	.0025	.6739	-1.642	.61	.59	2124
1975-76	.0006	.0028	.6290	-1.6438	.60	.61	1696
			Males				
1975-76	.0007	.0026	.6392	-1.6123	.60	.62	1441
1974-75	.0008	.0026	.5632	-1.3803	.63	.57	1295
1973-74	.0004	.0032	.6972	-2.0456	.59	.63	1211
1972-73	.0004	.0030	.6127	-1.6712	.59	.61	1271
1971-72	.0004	.0031	.6298	-1.9102	.57	.58	1250
1970-71	.0007	.0028	.5659	-1.7115	.56	.57	1494
			Females				
1975-76		.0033	.7107	-2.0101	.62	.60	255
1974-75	.0009	.0030	.7070	-2.285	.60	.59	216
1973-74	-.0002	.0031	.5629	-1.1770	.65	.51	154
1972-73	.0002	.0030	.7059	-1.8219	.63	.54	103
1971-72	.0005	.0032	.6307	-2.0113	.56	.53	68
1970-71	.0003	.0033	.7946	-2.5598	.60	.62	60

SEE: Standard Error of Estimate
R: Multiple Correlation

NOTE: Based upon the Normative Data books published by the Regents of the University System of Georgia, Atlanta.

Table D - 4

Predictive Equations for Grade Point Averages for Beginning Freshmen Attempting 25 or More Hours, Fall through Spring Quarters 1970-71 - 1979-80

Clayton Junior College

Year	SAT Verbal	SAT Math	High School GPA	Constant	SEE	R	N
			Total				
1979-80							
1978-79	.0026	-.0003	.5623	-.5365	.57	.63	336
1977-78	.0028	.0002	.5822	-.8064	.59	.62	405
1976-77	.0023	.0004	.4982	-.2802	.62	.58	463
1975-76	.0023	.0005	.3596	.0669	.68	.49	618
			Males				
1975-76	.0024	.0011	.2460	-.1054	.68	.45	305
1974-75	.0018	.0016	.2311	.0579	.72	.39	210
1973-74	.0024	.0011	.3204	-.0421	.59	.50	312
1972-73	.0028	.0015	.3770	-.5963	.66	.53	184
1971-72	.0015	.0010	.3719	.2791	.64	.45	277
1970-71	.0019	.0018	.4113	-.4984	.68	.46	215
			Females				
1975-76	.0022	.0011	.2438	.3627	.65	.48	313
1974-75	.0033	-.0005	.3632	.2354	.61	.52	211
1973-74	.0015	.0010	.4531	.1790	.54	.55	314
1972-73	.0019	.0009	.5837	-.3421	.55	.66	211
1971-72	.0023	.0006	.4481	.0870	.55	.60	225
1970-71	.0022	.0016	.5138	-.5724	.51	.66	187

SEE: Standard Error of Estimate
R: Multiple Correlation

NOTE: Based upon the Normative Data books published by the Regents of the University System of Georgia, Atlanta.

Table D - 5

Predictive Equations for Grade Point Averages for Beginning Freshmen
Attempting 25 or More Hours, Fall through Spring Quarters
1970-71 - 1979-80

Kennesaw College

Year	SAT Verbal	SAT Math	High School GPA	Constant	SEE	R	N
			Total				
1979-80							
1978-79	.0015	.0014	.6202	-.9474	.63	.59	430
1977-78	.0022	.0006	.8894	-1.6502	.64	.67	426
1976-77	.0022	.0009	.6987	-.9539	.64	.62	546
1975-76	.0029	.0005	.5737	-.8504	.68	.58	532
			Males				
1975-76	.0024	.0010	.4352	-.6007	.74	.47	248
1974-75	.0024	.0004	.4446	-.2434	.70	.53	188
1973-74	.0017	.0005	.6948	-.5624	.67	.62	188
1972-73	.0015	.0010	.6014	-.3846	.57	.63	197
1971-72	.0022	-.0001	.4373	.0115	.70	.49	195
1970-71	.0018	.0015	.6775	-1.3464	.65	.61	174
			Females				
1975-76	.0032	.0007	.5436	-.8973	.62	.63	284
1974-75	.0029	-.0001	.7690	-1.0258	.54	.73	178
1973-74	.0020	.0014	.5198	-.5234	.61	.64	219
1972-73	.0023	.0010	.5956	-.6234	.59	.64	197
1971-72	.0013	.0019	.5308	-.4834	.62	.65	177
1970-71	.0020	.0016	.7159	-1.4211	.62	.68	161

SEE: Standard Error of Estimate
R: Multiple Correlation

NOTE: Based upon the Normative Data Books published by the Regents of the University System of Georgia, Atlanta.

Table D - 6

Predictive Equations for Grade Point Averages for Beginning Freshmen Attempting 25 or More Hours, Fall through Spring Quarters 1970-71 - 1979-80

West Georgia College

Year	SAT Verbal	SAT Math	High School GPA	Constant	SEE	R	N
			Total				
1979-80							
1978-79	.0018	.0018	.6448	-1.2512	.59	.66	647
1977-78	.0027	.0012	.5769	-1.0234	.61	.67	778
1976-77	.0026	.0010	.6226	-.9456	.58	.69	694
1975-76	.0025	.0014	.5853	-.9097	.62	.67	701
			Males				
1975-76	.0025	.0016	.5653	-.9563	.66	.63	308
1974-75	.0024	.0002	.5586	-.1571	.59	.62	315
1973-74	.0027	.0006	.5112	-.2901	.55	.65	275
1972-73	.0021	.0002	.5926	-.2799	.57	.58	434
1971-72	.0027	.0008	.3376	-.1752	.62	.48	461
1970-71	.0026	-.0001	.4424	+.0064	.53	.60	565
			Females				
1975-76	.0025	.0011	.6051	-.8806	.59	.69	393
1974-75	.0023	.0015	.4729	-.2848	.52	.71	338
1973-74	.0032	.0078	.5094	-.6219	.52	.68	315
1972-73	.0029	.0010	.6508	-1.0195	.54	.68	432
1971-72	.0024	.0003	.3576	-.2690	.54	.63	603
1970-71	.0023	.0011	.5682	-.7403	.54	.74	659

SEE: Standard Error of Estimate
R: Multiple Correlation

NOTE: Based upon the Normative Data Books published by the Regents of the University System of Georgia, Atlanta.

Table D - 7

Predictive Equations for Grade Point Averages for Beginning Freshmen Attempting 25 or More Hours, Fall through Spring Quarters 1970-71 - 1979-80

Georgia Southern College

Year	SAT Verbal	SAT Math	High School GPA	Constant	SEE	R	N
			Total				
1979-80							
1978-79	.0025	.0010	.5857	-.9351	.59	.60	864
1977-78	.0019	.0014	.5929	-.8132	.56	.63	1028
1976-77	.0015	.0016	.6119	-.7614	.54	.65	1008
1975-76	.0013	.0016	.5252	-.3511	.60	.60	983
			Males				
1975-76	.0007	.0018	.4779	-.1063	.62	.55	427
1974-75	.0017	.0014	.4328	-.1966	.59	.54	362
1973-74	.0017	.0013	.6199	-.6877	.58	.59	391
1972-73	.0016	.0011	.7006	-.8515	.59	.60	461
1971-72	.0019	.0013	.3789	-.2835	.54	.50	474
1970-71	.0020	.0022	.3475	-.7695	.61	.51	565
			Females				
1975-76	.0017	.0016	.5310	-.5255	.57	.64	556
1974-75	.0021	.0018	.6091	-1.0286	.54	.70	502
1973-74	.0018	.0012	.6411	-.6755	.54	.64	482
1972-73	.0020	.0017	.6352	-.9423	.56	.65	650
1971-72	.0022	.0013	.5272	-.7117	.49	.67	700
1970-71	.0027	.0014	.5600	-1.1346	.52	.70	659

SEE: Standard Error of Estimate
R: Multiple Correlation

NOTE: Based upon the Normative Data books published by the Regents of the University System of Georgia, Atlanta.

Table D - 8

Predictive Equations for Grade Point Averages for Beginning Freshmen Attempting 25 or More Hours, Fall through Spring Quarters 1974-75 - 1979-80

A t l a n t a J u n i o r C o l l e g e

Year	SAT Verbal	SAT Math	High School GPA	Constant	SEE	R	N
			Total				
1979-80							
1978-79	.0022	.0009	.1093	1.5646	.59	.33	66
1977-78	-.0021	.0029	.4883	-1.1951	.67	.44	64
1976-77	.0019	.0033	.5408	-.4507	.66	.54	126
1975-76	.0026	.0015	.2800	.7119	.63	.45	212
			Males				
1975-76	.0017	.0017	.2652	1.0017	.65	.38	109
1974-75	.0017		.2013	1.8315	.50		67
			Females				
1975-76	.0036	.0015	.2793	.3879	.63	.53	103
1974-75	.0022	.0007	.2665	1.1654	.55	.40	70

SEE: Standard Error of Estimate
R: Multiple Correlation

NOTE: Based upon the Normative Data books published by the Regents of the University System of Georgia, Atlanta.